

U. S. DEPARTMENT OF AGRICULTURE - FOREST SERVICE  
PACIFIC SOUTHWEST FOREST AND RANGE EXPERIMENT STATION  
Division of Forest Insect Research

FOREST INSECT CONDITIONS  
SOUTHERN CALIFORNIA  
JUNE 1960

R. C. Hall spent the period of June 20 to June 29 in southern California investigating forest insect conditions in certain critical areas on or near the San Bernardino, the Cleveland and Angeles National Forests where requests for an evaluation had been received. The areas surveyed included May Valley, the Stable burn, Barton Flats, Julian-Pine Hills, Corte Madera, Laguna, Mt. Palomar, the Agua Tibia Wild Area, the Inaja and Mission Indian Reservations, Cuyamaca Rancho State Park, the Taubark Experimental planting and Charlton Chiloc. Most of the examination was made from the ground, but an aerial survey was conducted on the Arrowhead, Big Bear and San Geronio Districts of the San Bernardino.

Cooperators assisting in the survey included John Pierce, Area Technical Adviser for the Southern California National Forests, Assistant District Ranger John Peterson of the Descanso District, and ADR Dave Fessel of the Escondido District, Cleveland National Forest. Bob Blanford, Ian Dotta and Gene Snyder of the California Division of Forestry; Frank Hagerty of the Bureau of Indian Affairs; and Paul Jordan of the California Division of Beaches and Parks. A Turkish forest entomologist, Dr. Hassan, accompanied the party in the May Valley appraisal. There follows a discussion of conditions found.

San Bernardino National Forest

Forest insect problems in the following areas were investigated: May Valley, on the San Jacinto District, the Stable burn and adjoining area on the Arrowhead, Big Bear and San Geronio Districts.

May Valley

A joint survey of the bark beetle infestation in May Valley was attempted with local state and federal forest officers participating. It was originally planned to establish a series of about 400 circular  $\frac{1}{2}$ -acre sample plots in the area as a basis for evaluating damage by the western pine beetle in Coulter pine. A short training session was conducted prior to the survey to acquaint the participants with the type of information desired and the procedures to be used for obtaining it.

Extreme difficulty was encountered in finding any evidence of trees currently infested by the western pine beetle. The crew traversed all available roads in the area and found only one such tree. The basal portion of this tree was infested, but the upper portion had been killed by the overwintering brood. Attacks were very heavy in the base of this tree and eggs and small larvae were abundant.

Following the training session, the personnel were organized into three crews, and a series of 142 half-acre circular sample plots in the eastern portion of the infested area were established. Although many trees killed by overwintering broods were found, only two currently infested Coulter pines were located on the plots. Two additional currently infested trees were observed on about six miles of sample strips run. The number of infested trees found was so few that it was concluded that it was too early to conduct the survey of current conditions. Consequently sampling was discontinued.

One interesting item of information was obtained as the result of this work. Originally it was thought that May Valley was composed principally of Coulter pine, and that the major insect problem was due to ips beetles and the western pine beetle. The survey indicated that Coulter pine is generally restricted to the western portion of the Valley and that the principal tree species is Jeffrey pine. The principal insect in this host is the California flatheaded borer. An occasional ponderosa pine was also observed in the northeastern portion of the area.

The status of insect conditions in May Valley was discussed with the local state and federal forest officers, and it was brought out that several joint meetings with the private owners had been held to discuss needs for action to control bark beetles in this area. Sanitation-salvage logging on private and federal land has been suggested as one means of reducing insect damage. Plans are now underway to accomplish this. In view of the cutting program planned, a reappraisal in this area will probably not be necessary this fall.

#### Stable Burn

A fire which took place north of Lake Arrowhead on August 2, 1959, and covered about 1,740 timbered acres, resulted in the Stable burn. Part of the timber, principally the southern portion, was Jeffrey pine, but in the northern portion it was largely scattered Coulter pine on ridges and in the fringes of draws. This area was inspected from the air and the aerial survey was followed by a ground examination of areas where dying trees were observed. About 300,000 board feet of fire-killed and fire-injured trees, together with 120 overwintering insect-killed trees had been salvaged from the burn prior to this survey. Currently infested Coulter pine trees were very scattered. Evidence of recent attacks by the western pine beetle was found in two trees. Similar attacks in several others, where practically all of the cambium had been killed in the basal portion were suspected, but not confirmed. The color of the foliage in these trees were very characteristic of those attacked by insects, but it is possible that the trees had been killed by the fire and were very late in fading.

Some of these questionable trees should be felled to determine if they are attacked by insects in the top portion. Consideration should be given to treating all of the trees where they are known to be infested in order to prevent additional damage to the reserve stand within or adjacent to the burn. Experience has shown that when fire-injured trees are attacked by the western pine beetle, they become a real hazard to the remaining green stand. It is suggested that the area be kept under close scrutiny during the summer for further evidence of insect damage.

### Big Bear District

An inspection of the Big Bear District from the air showed considerable insect damage in pine around Big Bear Lake. Specific concentrations of loss were noted northeast of the lake and also to the south and west. Damage in this area is believed to be the work of the Jeffrey pine beetle in Jeffrey pine, but this point was not confirmed. In view of the increase in Jeffrey pine beetle activity over the winter, this area should be examined more thoroughly this fall to determine the status of the infestation.

### Barton Flats

Barton Flats on the San Geronimo District was inspected from the air and practically no loss was observed. This area was treated by sanitation-salvage in late 1953 and in 1954. Five years have elapsed since this area was cut over and the results continue to be encouraging. The average per acre loss on the 5,500 acres treated has been 26 board feet per year. An inspection of the upper Santa Ana area to the east of Barton Flats, where another sanitation-salvage operation is scheduled to start soon, showed very heavy losses in pine.

### Raywood Flats

An aerial inspection of the Raywood Flats area, also on the San Geronimo District, showed evidence of considerable insect activity in pine during the last season. There was also evidence of heavy older loss indicating that insects have been destructive in this area for some time. No ground examination could be made during this survey. The appearance of the damage suggests an aggressive infestation, which would warrant closer examination this fall. This area is being considered for treatment by sanitation-salvage but no time schedule has been set.

### Cleveland National Forest

The following areas were inspected on the Cleveland National Forest: the Julian-Pine Hills, the Cuyamaca Rancho State Park, the Corte Madera, Mt. Laguna, Mt. Palomar, the Agua Tibia Wild Area, and the Inaja and Mission Indian Reservations.

### Julian-Pine Hills

It was originally planned to make a systematic survey of the insect infestation in this area, but as in the case of May Valley, the trees attacked early this summer had not started to show up, so a general reconnaissance was made instead.

The Julian-Pine Hills area is largely in private ownership except on the western fringe where some of the land is owned by Forest Service and the remainder by the Indian Service. The principal tree species is Coulter pine and the principal insect species are the western pine beetle and the California five-spined ips. Insect damage in this area is of long-standing, and heavy losses have persisted for many years. No control work has been

undertaken during part of this period, due largely to lack of interest on the part of the principal private landowners. There was evidence of heavy group losses in Coulter pine caused by overwintering broods of ips and the western pine beetle. There is a strong likelihood that high losses from these beetles will continue in 1960.

If private owners become interested in a control program, as has been indicated recently, a systematic appraisal of the infestation in this area probably should be made sometime in the late fall.

#### Cuyamaca Rancho State Park

Some increase in California flatheaded borer activity in Jeffrey pine in Cuyamaca Rancho State Park was reported during the past winter. One area where this had happened was inspected and it was found that this particular increase had occurred in a locality where foliage damage by the black pine-leaf scale was very severe. According to Park personnel many of the trees treated to control flatheaded borers had been seriously injured by the scale. It was noted that some of these trees had only been partially killed by the borers and that the green butts had become infested with ips.

An inspection of the pandora moth infestation was made in the West Mesa area where full-grown larvae had been observed in early May. No larvae were found during the present inspection of June 21; presumably the insects were in the pupal stage. There was practically no evidence of defoliation by the pandora moth on any of the trees examined.

Consideration should be given to treating the ips-infested butts with 0.2 percent lindane spray in the flathead control area prior to the emergence of the first summer generation. It is suggested that the local Park staff keep a sharp lookout for adults of the pandora moth during the late summer of 1961.

#### Corte Madera

An inspection of the Corte Madera area on the Descanso District was made primarily to investigate the circumstances under which lindane was used to control ips in Coulter pine. Reports had been received from both state and federal forest officers that lindane had not proved effective against the beetles in this area. According to these reports, lindane sprayed on the green portion of the ips top-killed trees did not prevent subsequent beetle attacks. This inspection confirmed the fact that numerous green butted trees alleged to have been sprayed were subsequently attacked heavily and apparently produced abundant broods. The reason for the failure of lindane in southern California was not apparent, but any one of several causes could account for the difficulty. This insecticide has been used successfully against ips in northern California at the same dosage and with the same techniques as in southern California. Administrative studies to ascertain the cause of the difficulty are planned for this area by John Pierce. In these studies a series of paired trees will be felled and one of the pair sprayed with 0.2 percent lindane, while the other will be left unsprayed. The series will be checked subsequently to determine the number of attacking beetles per square foot in sprayed and unsprayed material. Another approach to be attempted is

to use up tagged pine bolts containing sprayed infested sections and unsprayed green material to absorb any emerging beetles.

A general reconnaissance of the Corte Madera <sup>area</sup> showed no signs of current tree-killing by ips.

#### Mt. Laguna

The Mt. Laguna area on the Descanso District was visited primarily to determine the status of the pandora moth where larvae were abundant in late April. As at the Cuyamaco Rancho State Park apparently all larvae had pupated. A diligent search was made in the soil around trees where larvae had previously been seen but no pupae were found. Several mummified large larvae were observed, some of which appeared to have been killed by a disease or parasites. Practically no signs of defoliation were evident.

In traveling through the Mt. Laguna area a striking contrast was noted in the areas where control of the California flatheaded borer had been undertaken in Jeffrey pine and other adjacent areas where no control work had been done. Forest Supervisor Stanley R. Stevenson and Robert S. McBride expressed interest in including the timberland in the control zone. In view of the apparent satisfactory results of efforts to control the California flatheaded borer in Jeffrey pine on Forest Service ownership, it would appear desirable to consider the possibility of enlarging the control zone.

#### Mt. Palomar

Hall and Pierce observed considerable overwinter loss from the western pine beetle in Coulter pine on Mt. Palomar in their aerial survey in mid-April. A ground inspection was made of the area on June 23. This inspection showed western pine beetle activity in Coulter pine to be aggressive in two specific areas. One group of 14 infested Coulter pines was found about 3 miles west of the Observatory in Sec. 30, T9S, R1E. The trees ranged from large poles to mature timber. The attacks appeared to have progressed from the bottom of the trees as evidenced by numerous successful pitch tubes. The foliage on some trees was straw colored, but most were green or just off color. The brood stages ranged from eggs to small larvae. This particular group of trees was on private land.

Another similar group of 9 trees was found in Sec. 29, T10S, R2E in Mendenhall Valley. These trees probably were also on private land although there is a possibility that they may be on Forest Service ownership. Several other freshly faded groups were observed but they were not examined.

In view of the very aggressive nature of the western pine beetle infestation in Coulter pine on Mt. Palomar, it is logical to expect that losses will continue at a high level here during the balance of 1960. The ownership pattern is mixed, private, State, University of California, Indian Service and Forest Service. A joint survey of the infestation would be desirable sometime in the fall to form the basis for deciding for or against control action.

### Agua Tibia Wild Area

The April aerial survey showed increasing losses in Coulter pine presumably from a combination of ips and the western pine beetle in the Agua Tibia Wild Area. On June 23, when the Wild Area was examined on the ground (principally by car over the road which traverses this area) there was very little evidence of recent damage. Most of the groups of trees killed by overwintering beetles were in very rough terrain well away from the road. Two Coulter pines on Agua Tibia Mountain freshly attacked by the western pine beetle were examined. One was a 36-inch tree and the other about 12 inches in diameter. Both had been attacked very heavily and the broods were mostly eggs and small larvae. The larger of the two trees was straw colored and the smaller one just slightly off color. Numerous large groups of up to 30 Coulter pine trees killed by beetles in 1959 were scattered throughout the Wild Area.

Due to the fact that the trees attacked this season were just beginning to fade when this survey was made, it is felt that the current appraisal is not too meaningful. Since there is considerable interest in giving this Wild Area maximum protection, further examinations of this area probably should be undertaken sometime this fall.

### Mission Indian Reservation

The Mission Indian Reservation which lies between the Mt. Palomar area and the Agua Tibia area was reconnoitered from the road. A few Coulter pines killed by overwintering broods of western pine beetle were observed, but no currently infested trees were seen. Since the road runs through rather dense timber, what was seen along the road may not be representative of conditions elsewhere on the reservation.

Insect problems on the Mission Indian Reservation should be considered either as a part of the Palomar Mountain or the Agua Tibia Wild Area and should be included in any subsequent survey made of either of these areas.

### Inaja Indian Reservation

A ground examination of a group of 30 mature Coulter pine trees killed by the western pine beetle on the Inaja Indian Reservation was made on June 21. Twenty-eight of the trees had been killed in 1959 and four were currently infested. Two of the four were green at the base and previously had been top-killed. Attacks were moderately heavy with the brood mostly in the egg stage. Two overwintering trees were found which still contained pupae and callow adults. Several Coulter pines cut by the County in roadway clearing on the Reservation were found to be heavily infested with the California five-spined ips.

Bark beetle conditions on this Reservation are comparable to those on adjacent Forest Service and private ownership and are part of the same problem. Any action program contemplated to control the beetles should take into consideration the entire area. The Reservation should be included in any subsequent surveys in the Julian-Pine Hills area. The attention of County authorities should be called to the need for treating ips-infested pine slash in roadside clearing or maintenance.

## Angelen National Forest

Two areas were checked on the Angelen National Forest. One was the Tanbark Experimental Forest plantation and the other was Charlton-Chilao.

### Tanbark Experimental Area

An examination was made of an insect infestation in Coulter pine in a small plantation on the ridge on the western boundary of the Tanbark Experimental area. Tree mortality had previously been reported in this plantation, but there had been some question as to the cause of death. This examination disclosed that the mortality resulted from a typical ips infestation. Nine infested pole-sized trees were spotted. The insect broods were mostly in the pupal stage, but an occasional callow adult was noted. One additional ips-infested tree was found on the experimental area. This tree, near the headquarters, had been cut and treated.

The bark beetle infestation in the plantation was discussed with District Ranger Anselmo Lewis of the Mt. Baldy District. Treatment of the infested trees is planned.

### Charlton-Chilao

An inspection was made of the Charlton-Chilao area on the Arroyo Seco District where the Forest is considering the possibility of a sanitation-salvage operation to reduce the hazard from damage from the western pine beetle in ponderosa and Coulter pine. This area has been under annual maintenance for a number of years. No current bark beetle infestation was observed in this area although there are a number of high risk trees scattered throughout the stand. Since the major tree species is ponderosa pine and since there appears to be a moderate number of high-risk trees present, sanitation-salvage cutting would probably help reduce the annual loss and thereby reduce the cost of direct control.

July 27, 1960  
Berkeley, Calif.

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